REMARKS

Reconsideration of this application, in view of the foregoing amendments and the following remarks, is respectfully requested.

Claim Objections

Claims 33-53 rejected under 35 U.S.C. 103(a) as being unpatentable over Youssefmir et al. (6795409) and further in view of Raleigh (6006110) and further in view of Paulraj et al. (6377636). Applicants respectfully traverse these rejections.

There are three basic criteria to establish a *prima facie* case of obviousness under 35 U.S.C. §103(a). First, there must be some suggestion or motivation in the cited references to modify or combine their teachings; second, there must be reasonable expectation of success; and third, the prior art references must teach or suggest all the claim limitations. *See* M.P.E.P §2142. As to claims 33, 38, and 43, the combination of cited references does not teach or suggest all the claim limitations.

Regarding claims 33, 38, and 43, the Examiner has stated that Paulraj discloses a beamforming system that uses training tones to estimate the noise of each channel (channel estimates) in order to use that noise estimate for the corresponding data tone in that channel (Col 10 lines 4-14)." (Emphasis added). Applicants respectfully point to the Examiner that a careful reading of Paulraj reveals that Paulraj allocates a dedicated subset of data tones to a given training pattern (*see* col. 13, lines 42-43). Further, a noise "estimator 128 is also supplied with the training patterns assigned to the desired signals and interferes." (col. 13, lines 48-50). Thus, the noise estimation in Paulraj is based on prior knowledge of dedicated training sequence for a subset of data tones. In a complete contrast, claim 33 recites estimating noise for a plurality of a first type of tones; and computing beamforming for at least one of a plurality of a second type of tones based at least in part on noise estimation of <u>at least one of the plurality of the first type of tones that is **nearest** the at least one of the plurality of the second type of tones in the signal</u>. The noise estimation according to claim 33 is based on noise estimation of a tone that is nearest to the given tone and not necessarily a dedicated tone.

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Further, the Examiner has stated that "In this embodiment the system inherently comprises an indexing function that uses the noise estimate of the **nearest training tone to each data tone for the purpose that the correct channel estimate** (with each channel comprising a training tone and it's nearest data tones) be used for each data tone." (Emphasis added). Applicants respectfully point to the Examiner that Paulraj does not even mention or suggest what the Examiner has stated. In fact, Paulraj does not even need an indexing function because Paulraj's noise estimation is based on dedicated subset of training sequences and not on the proximity of training sequence. In fact, Paulraj assumes coherent reception of training sequences (*see* col. 9, lines 3-15, figures 5A-B). Accordingly, claims 33, 38, 43, and those depend therefrom are clearly distinguishable from the combination of cited references.

As to claims 34 and 39, the Examiner has stated that "the noise estimator computes the difference (error signal) between a received training signal and a previous training signal (RALEIGH: Col 15 lines *25-40)*." (Emphasis added). Applicants respectfully point to the Examiner that the Examiner has combined Raleigh with Paulraj in rejecting claim 34, which depends from claim 33. Paulraj determines noise based on dedicated training sequence that requires prior knowledge of training sequences in the noise estimator. In contrast, Raleigh uses subspace components from past interference channel state (*see* col. 14, lines 57-60). "There must be some suggestion or motivation in the cited references to modify or combine their teachings and there must be reasonable expectation of success." Paulraj and Raleigh are two completely different systems and neither one can be combined to form what claim 34 has recited. Further, claim 34 recites computing two independent indications 1) a first indication of difference between first one of the first type of tones in one burst relative to the first one of the first type of tones in a preceding burst; and 2) a second indication of variance and correlation of the first indication. The Examiner has cited "RALEIGH: Col 11 lines 40-56" as describing two indications as recited in claim 34. Applicants respectfully point to the Examiner that a careful reading of the cited sections reveals that Raleigh actually describes two cost functions for the algorithm based on slowly varying channel and rapidly fading channels. These cost functions have no correlation with the computation of two indications as recited in claim 34. Applicant respectfully state that the cited reference is misplaced and claims 34 and 39 are clearly and patentably distinguishable from the cited references.

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As to claims 36, 41, and 46, the Examiner has stated that "As per claims 36,41,46, claim rejected for **same reasons as claim 51 rejection**." (Emphasis added). Applicants respectfully point to the Examiner that claim 51 recites a system and its elements where claim 36 recites specific steps of indexing tones, claims 51 does not recite these limitations. Further, claim 51 is rejected in the manner of claim 33. Applicants respectfully point to the Examiner that claims 36, 41, and 46 add specific limitations to their respective independent claims and respectfully request an independent examination of these claims with specific citation of references.

Applicant believes this application and the claims herein to be in a condition for allowance. Should the Examiner have further inquiry concerning these matters, please contact the below named attorney for Applicant.

Respectfully submitted,

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